

REMARKS

Drawings

The drawings are objected to because the lone figure is labeled "Fig. 1". A replacement sheet deleting the figure reference is enclosed. It is respectfully submitted that the drawings now comply with 37 CFR 1.84(u).

Specification

The specification was objected to because the lone figure was referred to as "Fig." in the brief description of the drawing and in the detailed description. These occurrences have been amended to refer to --the figure-- as suggested by the Examiner.

Claim Objections

Claim 1 has been amended as suggested by the Examiner and now recites --media particles; and--.

Claim 6 has been amended to depend from claim 2 instead of claim 4, thereby making claim 6 a proper dependent claim and overcoming the objection.

Claim rejections under 35 USC 102

Claims 1-3 and 13-15 are rejected under 35 USC 102(b) as being anticipated by Goose et al., U.S. 4,531,953. This rejection is traversed because Goose fails to teach or suggest a method that involves impregnating both a solid impregnant and a fluid impregnant onto support media where (a) the solid is added via sublimation; and (b) the fluid is added via non-bulk contact. Goose teaches only sublimation and fails to teach carrying out sublimation while also carrying out fluid impregnation via nonbulk contact. Goose also warns that sublimation should be carried out in the absence of added water, e.g., fluid, thus teaching away from the invention.

In more detail, it is important to appreciate that the claimed method is not merely subliming a solid impregnant, such as TEDA (an amine), onto support media. Rather, the present invention relates to a combination in which sublimation is used to add a solid

impregnant onto support media while nonbulk contact also is used to add a fluid impregnant to the media as well.

At least portions of the claimed subliming and nonbulk contact steps occur at the same time.

Significantly, the present invention provides an approach for beneficially incorporating both a solid organic impregnant and a fluid impregnant into filter media particles without the presence or addition of one unduly affecting the performance of the other. The invention is especially suitable when the filter media particles already contain or are to contain one or more other impregnants, whose function or presence might be adversely affected when conventional methods are used to add the solid organic and fluid materials. For example, if any of the impregnants are water soluble materials (such as some amines and most metal salts), trying to add water to the particles via immersive contact with an aqueous liquid can wash the water soluble materials away. The present invention substantially avoids this problem.

An illustrative, concrete embodiment of the invention helps to appreciate how the invention may be practiced. TEDA, a solid amine, is sublimed onto support media in the presence of steam, water vapor, or a water mist. Thus, bulk contact with water preferably is avoided during and/or after the time that TEDA and/or other water soluble impregnants, if any, are added to the media. In this manner, both TEDA and water content are present on the resultant filter media.

Please refer to the data in Tables 1 and 2, in the examples. The data shows that both water and TEDA are added to support media without one compromising the performance of the other as might otherwise have been expected using conventional bulk processing to add the water. Additionally, the standard deviation data for the invention is much tighter than that for the comparative, indicating that the invention also offers more consistent, tighter performance.

Goose '953 fails to teach the claimed combination of steps. Goose '953 discloses a method of making an absorbent comprising: (a) impregnation of activated carbon with an amine compound by sublimation into the activated carbon, and (b) contacting the carbon with the amine in the gas phase while heating. However, Goose

utterly fails to teach any step in which a fluid impregnant is added to the media via non-bulk contact as claimed.

To the extent Goose mentions nozzles, see col. 3, lines 64-66, these were not used to make the impregnated media, but rather these nozzles merely were features of the canisters in which the resultant media were used.

Indeed, not only does Goose fail to teach impregnation of a fluid via nonbulk contact in combination with sublimation impregnation, but Goose expressly instructs the skilled worker to carry out sublimation in the absence of added water. See added claim 1. At col. 2, lines 49-51, Goose states, “The amine is allowed to sublime into the activated carbon. No water or moisture is added, and the atmosphere is preferably dry.” Note, too, col. 3, lines 1-7, where Goose prefers carbons with as little moisture content as feasible.

These negative teachings lead the skilled worker away from the invention, not toward it.

The shortcomings of Goose are shown in the following table:

Claimed Feature	Is the Feature Present in Goose?
(b) during at least a portion of said sublimation, causing a fluid impregnant to contact and be incorporated into the filter media particles via non-bulk contact	No. Nothing even close to this step is recited in Goose.

In view of these remarks, it is respectfully submitted that the claims are patentably distinct over Goose. Withdrawal of the rejection is respectfully requested.

Claims 1-3, 7-8 and 10-15 are rejected under 35 USC 102(b) as being anticipated by Liang et al., U.S. 5,462,908. This rejection is traversed.

Liang suffers from the same deficiencies as Goose. Although Liang teaches a sublimation step, Liang fails to teach combining sublimation with simultaneous non-bulk impregnation of a fluid impregnant as claimed.

Liang also teaches away from the claimed combination of steps. Liang mandates that the media must be dry when sublimation occurs. See, e.g., Liang at col. 2, lines 4-6.

A skilled worker following Liang's directions thus would be led toward dry conditions, not toward simultaneous non-bulk contact with a fluid as is claimed.

Accordingly, it is respectfully submitted that the claims are patentable over Liang. Withdrawal of the rejection is respectfully requested.

Claim rejections under 35 USC 103

Claim 9 is rejected under 35 USC 103(a) as being unpatentable over Liang '908 as applied to claim 7, and further in view of Goose '953.

The Examiner has stated that Goose '953 discloses spraying onto the surface with a nozzle spraying device, and that it is considered that it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the spraying device of Goose in the breathing absorbent of Liang because Goose discloses his spraying device in a process for making a breathable absorbent in gas masks to remove cyanogens chlorides over longer periods and Liang specifically references the teachings of Goose as relevant prior art.

We respectfully submit that Goose has been misconstrued. It is true that Goose discloses nozzle use. However, Goose does not teach nozzle use in the context of making filter media, but rather teaches nozzles in the context of using the resultant media. As to nozzle use specifically, Goose mentions nozzles at col. 3, lines 64-66. There, nozzles are part of the canister in which the media is used, not in which the media is made.

There is absolutely nothing in Goose that even remotely discloses dispensing a fluid onto support media at the same time that a solid material is sublimed onto the media. As to sublimation, Goose expressly instructs that sublimation occurs under dry conditions. This is the antithesis of using a nozzle to dispense fluid during sublimation and does not lead to the invention or support the proposed combination with Liang.

Thus, nothing in Goose teaches or suggests using a nozzle in the Liang process as proposed by the Examiner. Therefore, the proposed combination is improper because there is no factual basis in Goose to support the rejection. Withdrawal of the rejection is respectfully requested.

CONCLUSION

In view of the above remarks, it is respectfully submitted that the claims and the present application are now in condition for allowance. Approval of the application and allowance of the claims is earnestly solicited. In the event that a phone conference between the Examiner and the Applicant's undersigned attorney would help resolve any remaining issues in the application, the Examiner is invited to contact said attorney at (651) 275-9804.

Respectfully Submitted,

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